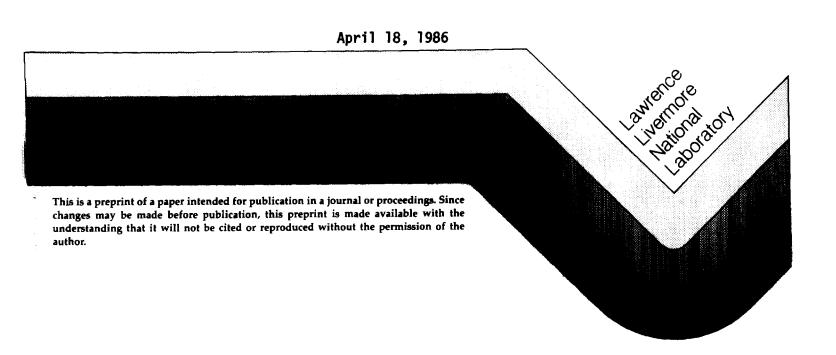
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THE Be-Ir (BERYLLIUM-IRIDIUM) SYSTEM

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Equilibrium Diagram

No phase diagram data are available. Two intermediate phases, (1) Be₁₇Ir₂ (10.5 at.% Ir) [71Ver] or Be₂Ir (x = 5 to 20) [70Joh] and (2) Be₂Ir [36Mis], were reported. Be₂Ir may be isotypic with Be_{3.6}Rh [70Joh].

The melting point of β Be and the β Be --> α Be allotropic transformation temperature are 1289±4 and 1270±6 °C, respectively [85BAP]. The melting point of Ir is 2447 °C [81BAP].

[80Tan] predicted the existence of a stable or metastable phase, BeIr, having the CsCl-type crystal structure from the study of a series of Betransition metal systems. However, since this system is still incomplete, it is possible that BeIr may be present as a stable phase as in the Be systems with Rh, Pd, and Pt, all neighbors of Ir in the periodic table [850ka1, 850ka2, 850ka3].

Crystal Structures

A summary of crystal structure and lattice parameter data is given in Table 1.

The hexagonal lattice parameters of Be_{TZ}Ir $_{2}$ [71Ver] and of Be $_{8}$ Ir [70Joh] are nearly same but the structures differ in symmetry details, where both are derivative of the CaCu $_{8}$ prototype. The formula Be $_{6}$ $_{8}$ Ir is due to partial occupancy of lattice sites, as determined with great accuracy in a single-crystal study of Be $_{6}$ $_{8}$ Rh [70Joh]. These results are preferred over the powder XRD examination of [71Ver].

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- 850ka2: H. Okamoto and L.E. Tanner, "The Be-Pd (Beryllium-Palladium) System", to be published in <u>Bull. Alloy Phase Diagrams</u> (1985). (Equi Diagram; Compilation)
- 850ka3: H. Okamoto and L.E. Tanner, "The Be-Pt (Beryllium-Platinum) System", to be published in <u>Bull. Alloy Phase Diagrams</u> (1985). (Equi Diagram; Compilation)
- * Indicates key paper.

Table 1 Be-Ir Crystal Structure and Lattice Parameter Data

Composition, Phase at.% Ir		Struktur- n bericht designation	Space group	Proto- type	Lattice a	paramete c	ers, nm Reference
(βBe) 0	cI2	A 2	I m3m	W	0.25515		[82Kin]
(αBe) 0	hP2	A3	P6 a/mmc	Mg	0.22857	0.35839	[81Kin]
Be _m Ir(a) ? Be ₁₇ Ir ₂ 10.5	(hexagonal)(b) (hexagonal)		P6m2 P6/mm		0.4197 0.4193	1.0842 1.089	[70Joh] [71Ver]
Be ₂ Ir 33.3	(c)	?	?	3.	?		[36Mis]
BeIr(d) 50	cP2	B2	Pm3m	CsCl	?		[80Tan]
(Ir)100	cF4	A1	Fm3m	Cu	0.38391		[81Kin]

⁽a) x = 5 to 20. (b) Closely related to $D2_{st}$. (c) Complex. Similar to $Be_{st}Rh$.

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